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The pictured caves of La Crosse valley, by Edward Brown.
The theogony of the Sioux, by Stephen R. Riggs.
Teutonic mythology, by Rasmus B. Anderson.
Human sacrifices in ancient times. Trans., by L. P. Gratacap.
Prehistoric relics of Lowndes county, Miss., by Albert C. Love.

In the oriental department we have notes from Selah Merrill, A. H. Sayce and O. D. Miller. The correspondence, editorial notes, archæological notes, linguistic notes, art and architecture, and exchanges are unusually full and valuable.

MOUND RELICS FROM ILLINOIS.—Dr. P. R. Hoy, of Racine, Wisconsin, sends us photographs of a cranium taken from one of a group of mounds near Albany, Illinois. The tumuli are on the summit of a high ridge overlooking the Mississippi river. The one from which the skull was exhumed is about eight feet high, and forty feet in circumference. The skeleton was in a sitting posture at the base of the mound, the soil about it being of a darker color than that of the ridge below. On the top of the cranium was an inverted dish, holding about as much as a good sized tea-cup, the depth being just half the diameter. The outside is covered with fine basket markings, and four shields cross-barred, two of them with a central ring, are embossed at equal distances on the outside.

ANTHROPOLOGICAL NEWS.—The "*Archiv für Antropologie* has introduced a department of abstracts from anthropological literature foreign to Germany. Dr. Emil Schmidt, of Essen, Rhenish Prussia, has charge of that portion relating to America. He is very anxious to receive copies of all publications relating to our special subject. The last number reviews the Peabody Museum, the Davenport Academy, the American Antiquarian, and the NATURALIST.

GEOLOGY AND PALÆONTOLOGY.

THE DEVONIAN INSECTS.—Mr. S. H. Scudder has recently published a memoir on the oldest known insects, those found in the Devonian of New Brunswick. The locality from which the specimens were obtained, is not far from the town of St. Johns, from shales very rich in vegetable remains, and was discovered by the late Prof. C. F. Hartt. Six species are described by Mr. Scudder, and as may be supposed, are of considerable interest. A stratigraphic section by Professor J. W. Dawson accompanies the memoir. Mr. Scudder's conclusions are as follows:

" It only remains to sum up the results of this re-examination of the devonian insects, and especially to discuss their relation to later or now existing types. This may best be done by a separate consideration of the following points :

"There is nothing in the structure of these earliest known insects to interfere with a former conclusion that the general type of wing structure has remained unaltered from the earliest times. Three of these six insects (Gerephemera, Homothetus, Xenoneura) have been shown to possess a very peculiar neuration, dissimilar from both carboniferous and modern types. As will also be shown under the tenth head, the dissimilarity of structure of all the devonian insects is much greater than would be anticipated; yet all the features of neuration can be brought into perfect harmony with the system laid down by Heer.

"The earliest insects were hexapods, and as far as the record goes, preceded in time both arachnids and myriapods.

"They were all lower Heterometabola.

"They are all allied or belong to the Neuroptera, using the word in its widest sense.

"Nearly all are synthetic types of comparatively narrow range.

"Nearly all bear marks of affinity to the carboniferous Palæodictyoptera, either in the reticulated surface of the wing, its longitudinal neuration, or both.

"On the other hand they are often of more and not less complicated structure than most Palæodictyoptera.

"With the exception of the general statement under the fifth head they bear little special relation to carboniferous forms, having a distinct facies of their own.

"The devonian insects were of great size, had membranous wings and were probably aquatic in early life. The last statement is simply inferred from the fact that all the modern types most nearly allied to them are now aquatic.

"Some of the devonian insects are plainly precursors of existing forms, while others seem to have left no trace. The best examples of the former are Platephemera, an aberrant form of an existing family; and Homothetus which, while totally different in the combination of its characters from anything known among living or fossil insects, is the only palæozoic insect possessing that peculiar arrangements of veins found at the base of the wings in Odonata typified by the arculus, a structure previously known only as early as the Jurassic. Examples of the latter are Gerephemera, which has a multiplicity of simple parallel veins next the costal margin of the wing, such as no other insect ancient or modern is known to possess; and Xenoneura, were the relationship of the internomedian branches to each other and to the rest of the wing is altogether abnormal.

"If, too, the concentric ridges, formerly interpreted by me as possibly representing a stridulating organ, should eventually be proved an actual part of the wing, we should have here a structure which has never since been repeated even in any modified form.

"They show a remarkable variety of structure, indicating an abundance of insect life at that epoch.

"The devonian insects also differ remarkably from all other known types, ancient or modern; and some of them appear to be even more complicated than their nearest living allies.

"We appear, therefore, to be no nearer the beginning of things in the devonian epoch than in the carboniferous, so far as either greater unity or simplicity of structure is concerned; and these earlier forms cannot be used to any better advantage than the carboniferous types in support of any special theory of the origin of insects.

"Finally, while there are some forms which, to some degree, bear out expectations based on the general derivative hypothesis of structural development, there are quite as many which are altogether unexpected, and cannot be explained by that theory without involving suppositions for which no facts can at present be adduced."

AMERICA'S COAL SUPPLY.—Mr. P. W. Sheafer, of Pottsville, writes as follows respecting the supply of coal of the United States, and the methods of mining it: The coal resources of Great Britain are all developed now, and in process of depletion; whilst in this country when our four hundred and seventy square miles of anthracite are exhausted, we have more than four hundred times that area, or 200,000 square miles of bituminous, from which to supply ourselves and the rest of mankind with fuel. The coal product of the world is about 300,000,000 tons annually. The North American continent could supply it all for two hundred years. With an annual production of 50,000,000, it would require twelve centuries to exhaust the supply. But with a uniform product of 100,000,000 tons per annum, the end of the bituminous supply would be reached in eight hundred years. What the annual consumption will be when this continent supports a teeming population of 400,000,000 souls, as will be the case some day, must be left to conjecture. But with half that population, as energetic, restless and inventive as our people in this stimulating climate have always been, under the hopes of success, such a country as this constantly holds out to tempt ambition and reward enterprise, it is a very moderate estimate, guided by the actual output already reached in Great Britain, to suppose that there will be ample use for one hundred million tons a year of bituminous coal for home consumption alone.

We have about three hundred and forty collieries, and produce 20,000,000 tons per annum, or about 60,000 tons each. Great Britain has nearly four thousand collieries, and mines 132,000,000 tons, or 33,000 tons per colliery. The greater the yield per colliery the less the expense in mining. If we decrease the number of mines and increase their capacity not only to raise the coal, but to exhaust a constant current of foul air and dangerous gases, clouds of powder smoke and millions of gallons of water, we will reduce the cost of mining. Most of the anthracite mining in the United States is now done at a less depth than five hundred feet vertical; but as the coal nearer the surface becomes exhausted, the mines must go deeper and become more expensive.—*Proceedings of the American Association for Advancement of Science, 1879.*

THE NORTHERN WASATCH FAUNA.—The following species have been received from Mr. Wortman from the beds of the Wind River group, subsequent to the publication of my last notice of his discoveries:[1] (1) *Esthonyx spatularius*, sp. nov. Represented by five molar and premolar, and two incisor or canine teeth, apparently belonging to one individual. These are about the size of those of *E. bisulcatus*, but present several differences of detail. Thus the basin of the heel of the last inferior molar is not obliquely cut off by a crest which extends forwards from the heel, but is surrounded by an elevated border, which rises into a cusp on the external side. The incisor-canine teeth are more robust than those of *E. bisulcatus*, one of them especially having a spoon-shaped crown, with the concave side divided by a longitudinal rib, on which the enamel is very thin. The enamel descends much further down on the external than the internal side of these teeth. The rodent-like tooth does not accompany the specimen. Length of base of last inferior molar, .009; width anteriorly, .005; length of crown of canine-incisor No. 1, .009; width of do. at base, .005; length of crown of second canine-incisor at base, .012; width of do., .006. (2) *Didymictis leptomylus;* represented by the posterior three inferior molars. These indicate a species of smaller size than the *D. protenus*, with the tubercular molar relatively narrower, and perhaps longer. The anterior part of the latter has the three cusps well defined and close together, and behind them is an oblique longitudinal cutting edge. The middle of the posterior margin rises into a tubercle. The anterior cusps of the tubercular sectorial are elevated; the heel has a strong external cutting edge and internal ledge. Length of tubercular sectorial, .009; width of do., .005; length of tubercular, .007; width of do. in front, .0035. (3) *Hyopsodus speirianus*, sp. nov. Founded on a portion of a mandibular ramus supporting the last three molars in perfect preservation. It is distinguished by its very small size, since it is considerably less than the *H. vicarius (H.? minusculus)*, and by the equality in size of the molars. The heel of the third molar is very small, and the two cones of the inner side of the crowns of all the molars are acute. The external crescents are very well defined; the anterior sending a horn round the anterior extremity of the crown. The posterior is connected with the corresponding internal tubercle by a median conic posterior tubercle. Length of true molar series, .008; length of second molar, .0026; width of do., .0022; length of last true molar, .0025; width of do., .0016. Depth of ramus at second molar, .0043. Dedicated to my friend, Mr. Francis Speir, of Princeton, N. J., who, in connection with

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[1] NATURALIST, Oct. (Sept.), 1880, p. 745.

Messrs. Scott and Osborne, has made important additions to our knowledge of the Eocene *Vertebrata.*—*E. D. Cope.*

GEOLOGICAL NEWS.—Mr. Hébert has recently published in the *Comptes Rendus* an account of the geology of the British Channel.——The last number of the Palæontographica contains two important memoirs: Roëmer on a Carbonaceous chalk formation of the West Coast of Sumatra; and Branco on the development of the extinct *Cephalopoda.*——M. Filhol having finished his work on the extinct *Vertebrata* of San Gerand le Puy, is about to publish one on those discovered at Ronzon.——The Powell Survey has just published Capt. Dutton's report on the Central Plateaus of the Colorado drainage.

GEOGRAPHY AND TRAVELS.[1]

PROCEEDINGS OF THE GEOGRAPHICAL SECTION OF THE BRITISH ASSOCIATION.—The British Association for the Advancement of Science, held its fiftieth meeting at Swansea from the 25th of August to the 1st of September. The President of the Geographical Section, Lieutenant General Sir J. H. Lefroy, F. R. S., in his opening address, spoke at length on the progress of discovery on our own continent.

In other regions geography was the pioneer of civilization and commerce. Here for the first time she had been outstripped, for the telegraph and the railway had tracked the forest or prairie, and traversed the mountains by paths before unknown to her.

Within living memory no traveler known to fame had crossed the American continent from East to West except Andrew Mackenzie in 1793. No traveler had reached the American Polar sea by land except the same illustrious explorer and Samuel Hearne.

The British Admiralty had not long before instructed Captain Vancouver to search on the coast of the Pacific for some near communication with a river flowing into or out of the Lake of the Woods.

In proceeding to notice the extensive explorations and surveys undertaken by the Government of the United States and of Canada, he alluded to the great aid afforded the former by the physical features of the region of their trigonometrical survey where sharp rocky peaks, bare of vegetation, rise to altitudes of 10,000 to 12,000 feet at convenient distances, in an atmosphere of singular purity; whilst in the British territory a vast region, wholly wanting in conspicuous points, is to be laid out in townships of uniform area. The law required that the eastern and western boundaries of every township be true astronomical meridians, and that the sphericity of the earth's figure be duly allowed for, so that the northern boundary must be less in measurement than the southern. All lines are required to be gone over twice

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[1] Edited by ELLIS H. YARNALL, Philadelphia.